M/003/007

State of Utah
DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

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February 9, 1989

Mr. Don A. Poulter, P.E.
D.P. Engineering, Inc.
7125 West Jefferson Ave., Suite 300
Lakewood, Colorado 80235

Re: Tug Mine
Plans and Specifications Review

Dear Mr. Poulter:

From our review of the hydrogeologic data for the Tug Mine project, near Wendover, Utah, dated December 2, 1988, we have the following comments:

1. Item 2
The aerial ground water coverage appears to address all the data currently known to us. However, we do not agree with the assessment made by Waste, Water and Land (WWL) that the water level at the mine site may be at a depth of 650 feet or more. The well log submitted for a well at the Stegall Ranch in Nevada shows water level at a depth of a 310 feet and in alluvial material. Because of the similar physiography at your mine site and the Stegall site, and location of springs and wind mills in the valley to the south, a water level of about 300± feet could be expected at the Tug Mine site.

Therefore, we are requesting an observation well be drilled near the center of Section 16, T8N R 19W SLB&N, downgradient the proposed pads to determine the water level and for water sampling. Please make geophysical logs of the well, including gamma and neutron recording. If the well is successful you can request a water permit from the State Engineer, and use it for a supply and monitoring well. Please advise us when you are ready to drill; enabling us to schedule our inspection.

2. Items 5 and 6

The design of heap leach pads without provisions to detect process fluids leaking into the ground water system is unacceptable. Concerning your meeting with our staff in June 1988, the statement that the Bureau would consider alternative leak detection systems need to be put into the proper context. The Bureau's position is and has been that a system to detect a failure in the liner system anywhere underneath the pad must be provided for possible corrective action, if any.

The detail for the heap leach pad liner system shows a 1125 trevira geotextile beneath the 12-inch secondary liner. The ore design height of 30-feet must be specified in the plans. Please be advised that geofabric has not demonstrated acceptable transmissivity properties under ore piles based on our research. This is the reason geogrids were developed. A complete set of plans and specifications including all revisions must be submitted to the Bureau for review. We can not continue the review process unless the Bureau has a complete and accurate understanding of the proposed project as communicated by the submittal.

4. Item 7
The specifications must be revised to include the minimum requirements which will result in a secondary clay liner with a permeability of 1.0×10^{-7} centimeter per second or less and submitted for review.

7. Item 12
The permeability of the leak detection base must be shown on revised plans or specifications which must be submitted to the Bureau for review to enable our review process to continue. The current design for this project utilizes trevira 1125 Geotextile under 30 feet of ore which will have a transmissivity rate of 5.72×10^{-4} feet approximately equivalent to 5.0×10^{-4} cm/sec. Be advised that there must be 3 orders of magnitude difference between the leak detection system media maximum permiability of 1.0×10^{-3} centimeters per second and the leak detection system base maximum permiability of 1.0×10^{-6} centimeters per second to meet the current design criteria.

8. Item 16
The geodrain minimum requirements must be specified on revised plans and specifications in order for the review process to proceed.

10. Item 19
The revised plans and specifications including approvable details for the process area liner must be submitted for the project review process to continue.

11. Item 20
This requirement will no longer be required in the specifications but will more appropriately be required in the operation and maintenance manual which must be approved by the Bureau prior to the initiation of operations. The operation and maintenance manual must specify that once liquid is detected in the leak detection sump, it must be evaluated to determine if in fact it is process fluid. If it is determined that the liquid is process solutions, operation of the pad or pond must discontinue until the leak is repaired. A leak is repaired when process solutions no longer flow through the liner system.

12. Items 21 and 22
    The indicated neutralization criteria must be included in the closure plan which must be approved by the Bureau prior to the initiation of operations.

14. Items 28 and 29
    This information must be incorporated in the revised plans and specifications and submitted to the Bureau for review if the project review process is to continue.

16. Item 32
    The information concerning the moisture content, density and permeability of clay materials must be included in the revised specifications and submitted to the Bureau for review otherwise an accurate and consistent concept of the project for review can not be achieved.

17. Item 34
    a. Our comments on this issue have already been addressed in No. 11 item 20.
    b. Our response concerning the process area has already been noted in No. 10 item 19. Provisions for securing the facility and protecting the facility from damage from animals still has not been found and must be included in revised plans and specifications and submitted for review.
    c. In communications with the Division of Oil, Gas and Mining, we understand that straw bales are not an acceptable means of controlling runoff for a project which will last 3 or 4 years because the bales break and a high maintenance effort is required. We request that this issue be resolved in writing with the Division of Oil, Gas and Mining with a copy to this Bureau.

18. Item 36
    c. The plans and specifications must be revised to include flexible membrane liner information and submitted before our review may continue.
    d. Based on communications with numerous HDPE suppliers and installers, 60 mils has been established as the standard for minimum thickness. Two major heap leach projects one under construction and the other in the final stages of design are in agreement with this requirement.

    e. Once a decision has been made concerning the liner for the chemical storage area the plans and specifications must be revised and submitted for review.

19. Item 37
    The volume of the three (3) process ponds shown on the drawings gives an estimated hydraulic capacity not including freeboard of 3,090,000 gallons. The design criteria submitted includes the 25-year storm event and the 48-hour draindown in the event of a power outage because of the short project life (i.e. less than three years). The state requires the 100-year, 24-hour storm event and a complete drain down in the event of a power outage design criteria be used on all projects. This is because total containment of all process solution is required which can only be accomplished with adequate hydraulic capacity. While it is true the project life is short at three years, it is considered necessary to use a more conservative factor for the reoccurance interval and complete draindown because the environmental impacts from anything less than this are considered unacceptable.

In conclusion, there are several references throughout this letter which outline different aspects of the project design which is considered to be inadequate. In order to assure the results of our review are appropriately incorporated into the design revised drawings and specifications must be submitted for review.

If there are any questions concerning the above please call Mack Croft or Charlie Dietz of my staff.

Sincerely,

Utah Water Pollution Control Committee

Don A. Ostler, P.E.
Executive Secretary

cc: Mr. Allen S. Gordon, Western States Minerals
Mr. Joel Hoyt, Bear River District Health Department
Mr. Lowell Braxton, Division of Oil, Gas and Mining
Mr. Dan Gross, State of Nevada

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